Remarks

Claims 1-19 are pending in the application. Claims 1-19 are rejected. All rejections and objections are respectfully traversed.

The claims have been amended to clarify that the term "speed" as used in the claims means a "frame rate" for playing back the video, and not to change the scope of what is claimed. In the art, it is well known that the speed at which a video is played is equivalent to the frame rate.

A method plays frames of a video adaptively according to a visual complexity of the video. A spatial frequency of pixel within frames of the video is measured, as well as a temporal velocity of corresponding pixels between frames of the video. The spatial frequency is multiplied by the temporal velocity to obtain a measure of the visual complexity of the frames of the video. The frames of the video are then played at a frame rate that corresponds to the visual complexity.

Claims 5-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite. Claim 5 has been amended to depend on claim 4.

Claims 1-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Meng et al., "Scene Change Detection in a MPEG Compressed Video Sequence" (Meng), in view of Rajagopalan et al., U.S. Patent No. 6,181,742 (Rajagopalan).

Meng does not describe the claimed playing of frames of a video adaptively at a frame rate according to visual complexity of the video. Meng detects abrupt scene change and special editing effects, such as a "dissolve," in compressed videos. Meng's detection is based on DCT coefficients and motion vectors. After the frames corresponding to scene changes are detected, a user can select the scenes and play the scene back. All playback is at a normal frame rate. Nowhere in Meng is there any indication that the playback is at any rate other than at the original frame rate, and certainly not at a frame rate that corresponds to the visual complexity of the frames.

Rajagopalan does cure the defects of Meng. Rajagopalan describes a system and method for encoding pictures according to a statistical complexity measures. At best, all Rajagopalan can do is drop frames if the encoding complexity is too great. Rajagopalan cannot change the playback frame rate in the way his encoding is performed. There is nothing in Rajagopalan that would indicate an adaptive playback of the encoded video according to his statistical complexity. Furthermore, Rajagopalan does not measure a *visual* complexity as claimed. Instead, Rajagopalan measures an *encoding* complexity.

It should be apparent to one skilled in the art that an encoding complexity is not a visual complexity. Thus, it should be obvious that Rajagopalan is not combinable with Meng. An encoding complexity designed for encoding a video cannot be used to detect scene changes as described by Meng. Meng and Rajagopalan teach in opposite directions. The Rajagopalan method can only be applied for encoding videos. The Meng method is applied during a

partial decoding of videos. Meng and Rajagopalan are incompatible with each other and cannot be combined.

The Examiner concludes the rejection with the statement:

> Therefore, it would have been obvious to one of ordinary skill in the art to combine the teachings of Meng and Rajagopalan, as a whole, for accurately, efficiently encoding and decoding video image data in a high quality, optimal manner (Rajagopalan col.3, ln.19-24).

Applicants again stress that the invention is not concerned with "encoding and decoding video images in an optimal manner." Instead, the claimed invention is concerned with playing back a video at a rate that corresponds to a visual complexity. For example, the complexity of the video is low, it can be played back at a relatively high frame rate. If the complexity is high, than the playback frame rate should be slow.

Claims 10-19 describe further limitations, namely:

averaging the visual complexity over a set of frames to determine a complexity of a video segment;

applying motion blur while plying the video to reduce aliasing;

wherein a speed of playing is inversely proportional to the visual complexity;

applying coring to spatial filter the video while playing;

wherein the video is uncompressed;

in which a temporal distortion of the video is minimized during playback;

in which the minimizing uses a quantization of the visual complexity;

in which the minimizing uses a smoothing and filtering of the visual complexity;

in which the minimizing constructs a piece-wise linear approximation of the visual complexity so that the visual complexity is substantially linear; and

in which the minimizing assigns a constant visual complexity to a consistent temporal segment of the video.

The Examiner dismisses these limitations with the statement:

> Note claims 10-19 have similar corresponding elements.

This is the sum total of the Examiner's reasoning for rejecting claims 10-19. No prior art is cited for the rejection. Furthermore, not a single element in claims 10-19 is "similar" to the elements in claim 1. Neither Meng nor Rajagopalan, alone or in combination, teach the elements of claims 10-19.

With all due respect, the Examiner's assertion is nothing more that an omnibus rejection and provides no reasonable level of understanding of the basis for the Examiner's position. As recognized in MPEP 707.07(d), "omnibus rejection of the claim ...is usually not informative and should therefore be avoided."

The Examiner's rejection ignores explicit limitations recited in claims 10-19. Note, particularly claim 12: "The method of claim 1 wherein *a frame rate of playing is inversely proportional to the visual complexity*."

MPEP 707.07(f) further mandates that "where a major technical rejection is proper, it should be stated with a ***full development*** of the reasons rather than by a ***mere conclusion*** coupled with some stereotyped expression."

The rejection by the Examiner is a mere conclusion, without a full development of reasons.

MPEP 706.07 further makes clear that "the invention as disclosed and claimed should be thoroughly searched in the first action and the references should be fully applied."

In the present application, the rejection fails not only to provide a reasonable rationale as to how, in the examiner's view, the applied art can be construed to teach each and every feature in the rejected claims, but the rejection also fails to even consider explicitly claimed features of the invention as recited in claims 10-19. None of the limitations are described in the references cited by the Examiner.

Meng does not disclose a *compressed* video that is played back at an adaptive frame rate.

As stated above, the Meng DCT coefficients and motion vectors are not used to play back a video at an adaptive frame rate.

Nowhere does Meng describe the functions of claims 4-7. The claimed complexity measure is based on perceptual considerations of *spatio-temporal sampling frequency*, and the frame rate is adjusted to achieve a constant *visual complexity*. This is similar to maintaining visual quality.

Meng does not describe any the limitations of claims 8-9. Again, the Examiner's statement is a mere conclusion.

It is believed that this application is now in condition for allowance. A notice to this effect is respectfully requested. Should further questions arise concerning this application, the Examiner is invited to call Applicants' attorney at the number listed below. Please charge any shortage in fees due in connection with the filing of this paper to Deposit Account 50-0749.

Respectfully submitted,
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